ABOUT THESE MAPS

Maps a, b and c show the at-sea density (birds/km^2) of Black-vented Shearwater (*Puffinus opisthemelas*) in three ocean seasons – Upwelling, Oceanic, and Davidson Current, displayed in cells of 5' latitude by 5' longitude. Densities are based on the combined data sets of several studies; see the Data and Analyses section of this chapter. The color and mapping intervals were selected to show the most structure and highlight significant areas, while allowing comparisons among marine bird species. Cells that were surveyed but in which no Black-vented Shearwaters were observed have a density of zero. Areas not surveyed appear white; no information was available for these areas. Blue lines indicate the boundaries of the National Marine Sanctuaries in the study area: Cordell Bank, Gulf of the Farallones and Monterey Bay. Bathymetric contours for the 200 m and 2,000 m isobaths are shown in light blue.

In order to provide an integrated look at the patterns of a species' spatial and temporal occurrence and abundance in the study area, map d shows seasonal high-use areas, displayed in cells of 10' latitude by 10' longitude, and also breeding colonies (when available). The seasonal high use map provides a further synthesis of densities presented in maps a, b and c, and portrays the relative importance of various areas to the species. Areas with consistently high use are highlighted. See the Data and Analyses section of this chapter for further explanation of high-use areas.

DATA SOURCES AND METHODS

The at-sea data set is referred to as the CDAS central California data set (1980-2001) and was developed using software called Marine Mammal and Seabird Computer Data Analysis System (CDAS), by the R.G. Ford Consulting Co. The data set extends from Pt. Arena to Pt. Sal in the study area, and the surveys used were conducted between 1980 and 2001. See the Data and Analyses section of this chapter for more information on the at-sea survey data sets and methods

RESULTS AND DISCUSSION

The Black-vented Shearwater occurs uncommonly in the study area principally during the Davidson Current Season and mainly during years of unusually warm-water temperatures (e.g., El Niño periods). Surveys in CDAS recorded 160 sightings of 1,752 individuals. Such low numbers precluded the use of a regression analysis to determine important habitat variables. The species was completely absent during the Upwelling Season, when the population is frequenting waters off its nesting islands in Mexico (Baja California). Almost all sightings during the Oceanic Season off central California, especially north of Monterey Bay, occurred during El Niño periods in 1994 and 1997. The sightings for this species in the study area occurred mostly over the continental shelf, within the bounds of the National Marine Sanctuaries. Although not reflected in the CDAS data, Black-vented Shearwaters do occur in all three National Marine Sanctuaries off north/central California.

Black-vented Shearwaters feed mostly on fish that they capture by pursuit plunging to shallow depths. See Tables 3.5, 3.10 and 3.11 for related summary information.